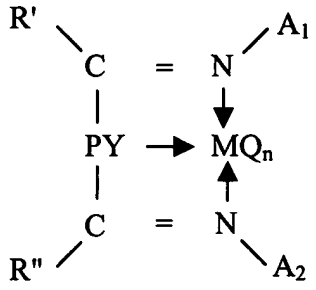
CLAIMS

1. An olefin polymerization catalyst composition comprising a Cs symmetric catalyst component characterized by the formula:



(a) wherein M is a transition metal selected from groups 4-11 of the Periodic Table;

(b) n is an integer of from 1 – 3;

(c) Q is a halogen or a $C_1 - C_2$ alkyl group;

(d) PY is a pyridinyl group, which is coordinated with M through the nitrogen atom of said pyridinyl group;

(e) R' is a $C_1 - C_{20}$ hydrocarbyl group;

(f) R" is a $C_1 - C_{20}$ hydrocarbyl group;

(g) A_1 is a mononuclear aromatic group, which may be substituted or unsubstituted; and

(h) A_2 is a polynuclear aromatic group, which may be substituted or unsubstituted.

2. The composition of claim 1 wherein R' is a $C_1 - C_4$ alkyl group or a mononuclear aryl group which may be substituted or unsubstituted and R" is a $C_1 - C_4$ alkyl group or a mononuclear aryl group which may be substituted or unsubstituted.

3. The composition of claim 1 wherein M is a transition metal selected from groups 8 –10 of the Periodic Table.

4. The composition of claim 3 wherein M is iron or cobalt and n is 2.

5. The composition of claim 1 wherein A_1 is a an unsubstituted phenyl group or a mono-substituted, di-substituted or tri-substituted phenyl group.

6. The composition of claim 5 wherein A_1 is a phenyl group which is mono-substituted at the directly distal position.

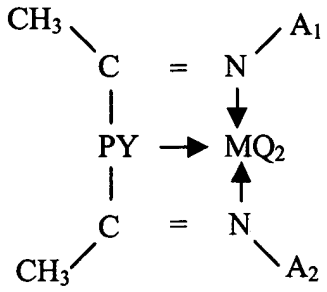
7. The composition of claim 5 wherein A_1 is a di-substituted phenyl group substituted at the proximal positions with $C_1 - C_4$ alkyl groups or is a tri-substituted phenyl group substituted with a $C_1 - C_4$ alkyl group at the directly distal position and $C_1 - C_4$ alkyl groups at the proximal positions.

8. The composition of claim 7 wherein A_2 is a terphenyl group which may be substituted or unsubstituted.

9. The composition of claim 8 wherein A_2 is a terphenyl group wherein the substituent phenyl groups are substituted on the primary benzyl group at the proximal positions with respect to the coordinating nitrogen ion.

10. The composition of claim 9 wherein both of the phenyl groups of A_2 are substituted at the para positions with $C_1 - C_4$ alkyl groups.

11. An olefin polymerization catalyst composition comprising a Cs symmetric catalyst component characterized by the formula:



(a) wherein M is a transition metal selected from the group consisting of iron, cobalt, nickel and copper;

(b) Q is a halogen or a $C_1 - C_2$ alkyl group;

(c) PY is a pyridinyl group, which is coordinated with M through the nitrogen atom of said pyridinyl group;

(d) A_1 is an aromatic group which may be substituted or unsubstituted; and

(e) A_2 is an aromatic group, which is substituted to provide a structure which is sterically different from A_1.

12. The composition of claim 11 wherein M is iron or cobalt.

13. The composition of claim 12 wherein A_1 is a di-substituted phenyl group which is di-substituted at the proximal positions with $C_1 - C_4$ alkyl groups.

14. The composition of claim 13 wherein A_2 is a terphenyl group which may be substituted or unsubstituted.

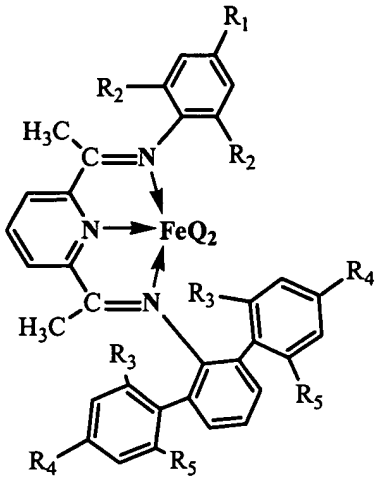
15. The composition of claim 13 wherein A_1 is di-substituted at the proximal positions with isopropyl groups.

16. The composition of claim 11 wherein A_1 is di-substituted at the proximal position with $C_1 - C_4$ alkyl groups and A_2 is a polynuclear aromatic group.

17. The composition of claim 16 wherein A_2 is a terphenyl group wherein the substituent phenyl groups are substituted on the primary benzyl group at the proximal positions with respect to the coordinating nitrogen ion.

18. The composition of claim 17 wherein both of the phenyl groups of A_2 are substituted at the para positions with $C_2 - C_4$ alkyl groups having a higher molecular weight than the substituents of A_1.

19. An olefin polymerization catalyst comprising a Cs symmetric catalyst component characterized by the formula:



(a) Q is a halogen or a $C_1 - C_2$ alkyl group;

(b) R_1 is a H or $C_1 - C_4$ alkyl group

(c) R_2 is a $C_1 - C_4$ alkyl group;

(d) R_3 is hydrogen or a $C_1 - C_4$ alkyl group;

(e) R_5 is hydrogen or a $C_1 - C_4$ alkyl group which can be the same as or different from R_3;

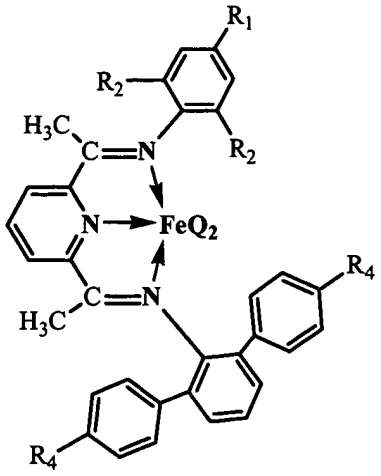
(f) R_4 is hydrogen or a $C_1 - C_4$ alkyl group.

20. The composition of claim 19 wherein R_2 is a isopropylene group.

21. The composition of claim 20 wherein R_4 is hydrogen.

22. The composition of claim 19 wherein Q is chlorine.

23. An olefin polymerization catalyst composition comprising a Cs symmetric catalyst component characterized by the formula:



(a) Q is a halogen or a $C_1 - C_2$ alkyl group;

(b) R_1 is a hydrogen or a methyl group;

(c) R_2 is a methyl or isopropyl group;

(d) R_4 is a $C_1 - C_4$ alkyl group.

24. The composition of claim 23 wherein R_4 has a higher molecular weight than R_2.

25. The composition of claim 23 wherein R_2 is a methyl group.

26. The composition of claim 25 wherein R_4 is an isopropyl or tertiary butyl group.

27. The composition of claim 26 wherein R_4 is a tertiary butyl group.

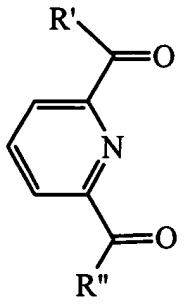
28. The composition of claim 27 wherein Q is chlorine.

29. The composition of claim 28 wherein R_1 is a methyl group.

30. A process for the preparation of a pyridinyl-linked bis-amino ligand comprising:

(a) reacting 2,6-dibromophenyl amine with an arylboronic acid component which is substituted or unsubstituted to produce a 2,6-diarylphenyl amine which is substituted or unsubstituted;

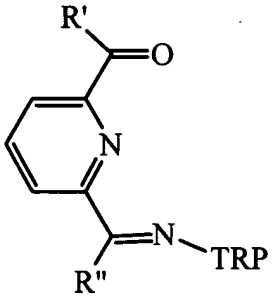
(b) reacting said 2,6-diarylphenyl amine with a 2,6-dialkanoic pyridine characterized by the formula:



(VI)

wherein R' and R" are each independently a $C_1 - C_{20}$ hydrocarbyl group;

to produce a mono-imine ligand characterized by the formula:

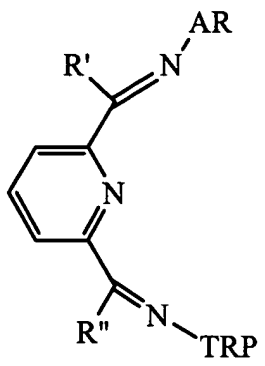


(VII)

wherein TRP is a terphenyl group which is substituted or unsubstituted

and;

(c) reacting said mono-imine ligand with an aniline which may be substituted or unsubstituted to produce a bis-amine ligand characterized by the structure:



(VIII)

wherein:

TRP is a substituted or unsubstituted terphenyl group; and

AR is a substituted or unsubstituted aryl group.

31. The process of claim 30 wherein R' is a $C_1 - C_4$ alkyl group or a mononuclear aryl group which may be substituted or unsubstituted and R" is a $C_1 - C_4$ alkyl group or a mononuclear aryl group which may be substituted or unsubstituted.

32. The process of claim 31 wherein said aniline is a mono-substituted, di-substituted or tri-substituted amino benzene.

33. The process of claim 32 wherein said aniline is a mono-substituted para $C_1 - C_4$ alkyl amino benzene.

34. The process of claim 32 wherein said aniline is a 2,6-dialkylamino benzene phenyl group substituted at the 2,6 positions with a $C_1 - C_4$ alkyl group, or a 2,4,6-trialkylamino benzene substituted with a $C_1 - C_4$ alkyl group at the directly distal 4 position and substituted at the 2,6 positions with a $C_1 - C_4$ group, which may be the same as or different from said distal alkyl group.

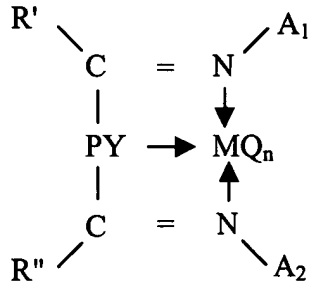
35. The process of claim 34 wherein said terphenyl group is a substituted terphenyl group.

36. The process of claim 35 wherein each of the substituents phenyl groups of the terphenyl group is substituted at the para position with a $C_1 - C_4$ alkyl group.

37. The process of claim 36 wherein each of the substituents phenyl groups of said terphenyl group is di-substituted at the directly proximal positions of said substituent phenyl group.

38. A process for the polymerization of an ethylenically unsaturated monomer comprising:

(a) providing a transition metal catalyst component having Cs symmetry characterized by the formula:



(I)

(i) wherein M is a transition metal selected from groups 4-11 of the Periodic Table;

(ii) n is an integer of from 1 – 3.

(iii) Q is a halogen or a $C_1 - C_2$ alkyl group;

(iv) PY is a pyridinyl group, which is coordinated with M through the nitrogen atom of said pyridinyl group;

(v) R' is a $C_1 - C_{20}$ hydrocarbyl group;

(vi) R" is a $C_1 - C_{20}$ hydrocarbyl group;

(vii) A_1 is a mononuclear aromatic group, which may be substituted or unsubstituted; and

(viii) A_2 is a polynuclear aromatic group, which may be substituted or unsubstituted.

(b) providing an activating co-catalyst component;

(c) contacting said catalyst component and said co-catalyst component in a polymerization reaction zone with an ethylenically unsaturated monomer under polymerization conditions to produce a polymer product by polymerization of said monomer; and

(d) recovering said polymer product from said reaction zone.

39. The process of claim 38 wherein said ethylenically unsaturated monomer is ethylene, a C_{3+} alpha olefin, or a C_{4+} conjugated diene.

40. The process of claim 39 wherein said ethylenically unsaturated monomer is ethylene.

41. The process of claim 40 wherein ethylene and a C_{3+} alpha olefin are supplied to said reaction zone to produce an ethylene alphaolefin copolymer.

42. The method of claim 41 wherein said C_{3+} alpha olefin is propylene to produce an ethylene-propylene copolymer.

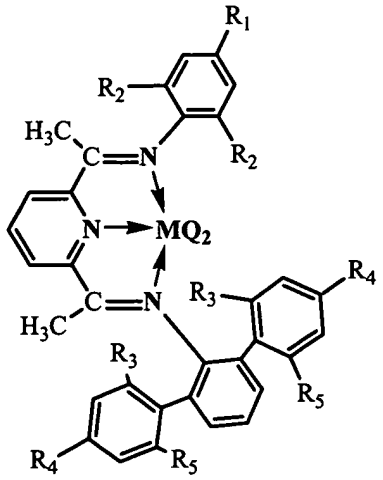
43. A polymer product produced by the process of claim 38.

44. The polymer product of claim 43 comprising an ethylene homopolymer or an ethylene alphaolefin copolymer.

45. An article of manufacture formed from the polymer product of claim 44 wherein said product is a product produced by injection molding, a product produced by blow molding, or a product produced by extrusion.

46. The article of claim 45 comprising a film produced by extrusion molding.

47. The process of claim 38 wherein said Cs symmetric catalyst component is characterized by the formula:



(a) Q is a halogen or a $C_1 - C_2$ alkyl group;

(b) R_1 is a H or $C_1 - C_4$ alkyl group

(c) R_2 is a $C_1 - C_4$ alkyl group;

(d) R_3 is hydrogen or a $C_1 - C_4$ alkyl group;

(e) R_5 is hydrogen or a $C_1 - C_4$ alkyl group which can be the same as or different from R_3;

(f) R_4 is hydrogen or a $C_1 - C_4$ alkyl group; and

(g) Wherein M is a transition metal selected from Groups 8-10 of the Periodic Table of Elements.

48. The process of claim 43 wherein M is iron or cobalt.

49. The process of claim 44 wherein activating co-catalyst is an alkylalumoxane.

50. The process of claim 45 wherein said alkylalumoxane comprises methylalumoxane or tri-isobutylalumoxane or mixtures thereof.